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ARMY ENVIRONMENTAL HYGIENE AGENCY ABERDEEN PROVING GR--ETC F/G 6/6  
TOPICAL HAZARD EVALUATION PROGRAM OF CANDIDATE INSECT REPELLENT--ETC(U)  
AUG 77 M H WEEKS, B J DESENA  
USAEHA-51-0855-77

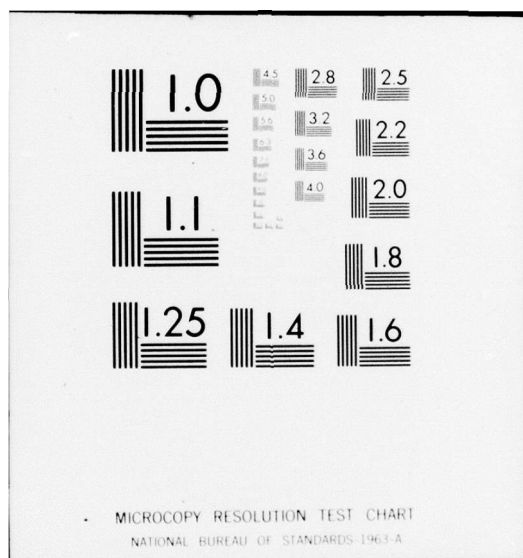
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TOPICAL HAZARD EVALUATION  
OF CANDIDATE INSECT REPELLENT AI3-36080  
LACTONE OF DIHYDROSASOME  
STUDY NUMBER 51-0855-77  
MARCH 1976 - JULY 1977

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|---|-----------------------|---|--|
| 1. REPORT NUMBER<br>51-0855-77  | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER<br>9  |  |
| 4. TITLE (and Subtitle)<br>Topical Hazard Evaluation Program of Candidate<br>Insect Repellent AI3-36080, Study No. 51-0855-77<br>Lactone of Dihydrosasome.  |                       | 5. TYPE OF REPORT & PERIOD COVERED<br>Final, Mar 76 - Jul 77                |  |
| 7. AUTHOR(s)<br>MAURICE H. WEEKS      BRENDA J. DeSENA  |                       | 6. PERFORMING ORG. REPORT NUMBER<br>51-0855-77                              |  |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>US Army Environmental Hygiene Agency<br>Aberdeen Proving Ground, MD 21010  |                       | 8. CONTRACT OR GRANT NUMBER(s)  |  |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>Commander<br>US Army Health Services Command<br>Fort Sam Houston, TX 78234   |                       | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS<br>D3 Aug 77 |  |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)   |                       | 12. REPORT DATE<br>Mar 76 - Jul 77  |  |
|   |                       | 13. NUMBER OF PAGES<br>7 (12 + 1 p.)  |  |
|   |                       | 15. SECURITY CLASS. (of this report)<br>Unclassified                        |  |
|   |                       | 15a. DECLASSIFICATION/DOWNGRADING<br>SCHEDULE                               |  |
| 16. DISTRIBUTION STATEMENT (of this Report)<br>Approved for public release; distribution unlimited.   |                       |   |  |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)  |                       |   |  |
| 18. SUPPLEMENTARY NOTES   |                       |   |  |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>AI3-36080      eye irritation<br>Lactone of Dihydrosasome      sensitization<br>Topical Hazard Evaluation Program      oral toxicity<br>candidate repellent      photochemical skin irritation<br>skin irritation   |                       |   |  |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>A hazard evaluation of AI3-36080 was conducted using New Zealand White rabbits for skin and eye studies; Hartley guinea pigs for a skin sensitization study; Sprague-Dawley, Wistar-derived rats for acute oral toxicity. The candidate compound produced no skin or eye irritation, no photochemical irritation, no sensitization reaction and did not demonstrate an acute ingestion hazard. Ethanol solutions of AI3-36080 caused mild skin irritation to both UV and non-UV irradiated skin sites. Based on these findings, it is recommended that AI3-36080 be approved for further testing as a candidate topical insect |                       |   |  |

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Item 20. → repellent. Medical surveillance should be made of individuals handling ethanol solutions of this compound.

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DEPARTMENT OF THE ARMY  
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND 21010

8 AUG 1977

TOPICAL HAZARD EVALUATION  
OF CANDIDATE INSECT REPELLENT AI3-36080  
LACTONE OF DIHYDROSASOME  
STUDY NUMBER 51-0855-77  
MARCH 1976 - JULY 1977

ABSTRACT

A hazard evaluation of AI3-36080 was conducted using New Zealand White rabbits for skin and eye studies; Hartley guinea pigs for a skin sensitization study; Sprague-Dawley, Wistar-derived rats for acute oral toxicity. The candidate compound produced no skin or eye irritation, no photochemical irritation, no sensitization reaction, and did not demonstrate an acute ingestion hazard. Ethanol solutions of AI3-36080 caused mild skin irritation to both UV and non-UV irradiated skin sites. Based on these findings, it is recommended that AI3-36080 be approved for further testing as a candidate topical insect repellent. Medical surveillance should be made of individuals handling ethanol solution of this compound.

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ABERDEEN PROVING GROUND, MARYLAND 21010

TOPICAL HAZARD EVALUATION  
OF CANDIDATE INSECT REPELLENT AI3-36080  
LACTONE OF DIHYDROSASOME  
STUDY NUMBER 51-0855-77  
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1. AUTHORITY.

a. Letter, US Department of Agriculture - Agricultural Research Service, Southern Region, Insects Affecting Man Research Laboratory, Gainesville, Florida, 11 March 1976.

b. Memorandum of Understanding between the US Army Environmental Hygiene Agency; the US Army Health Services Command; the US Department of the Army, Office of the Surgeon General; the Armed Forces Pest Control Board; and the US Department of Agriculture, effective December 1970 with Amendment No. 1, effective August 1974.

2. REFERENCE. Toxicology Division Procedural Guide, USAEHA, 1976.

3. PURPOSE. The purpose of this program is to provide guidance for further entomological testing of the candidate insect repellent AI3-36080.

4. SUMMARY OF FINDINGS. A hazard evaluation of the candidate repellent AI3-36080 (lactone of dihydrosasome) was conducted by this Agency using New Zealand White rabbits for skin and eye studies, Hartley guinea pigs for skin sensitization study and Sprague-Dawley, Wistar-derived rats for determination of oral toxicity. A tabular presentation of animal toxicity data developed in this Agency follows:\*†

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\* In conducting the studies described in this report, the investigators adhered to the "Guide for the Care and Use of Laboratory Animals," US Department of Health, Education and Welfare Publication No. (NIH) 74-23, revised 1972 - second printing 1974.

† The experiments reported herein were performed in animal facilities fully accredited by the American Association for the Accreditation of Laboratory Animal Care.

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Study No. 51-0855-77, Mar 76-Jul 77

| Test | Results | Interpretation |
|------|---------|----------------|
|------|---------|----------------|

SKIN IRRITATION STUDIES

Rabbits

Single 24-hour application to intact and abraded skin of New Zealand White rabbits.

0.5 ml technical grade compound applied to each of six rabbits.

Compound AI3-36080 produced no primary irritation of the intact skin or the skin surrounding an abrasion.

USAEHA Category I (ref Appendix).

EYE IRRITATION STUDIES

Rabbits

Single 24-hour application of 0.1 ml technical grade compound to one eye of each of six New Zealand White rabbits.

Compound AI3-36080 produced no injury to the cornea, and in addition no injury to the conjunctiva.

USAEHA Category A (ref Appendix).

APPROXIMATE LETHAL DOSE (ALD)

Oral

Rats (male) - no diluent.

ALD >4900 mg/kg

Presents little lethal hazard from acute accidental ingestion.



Study No. 51-0855-77, Mar 76-Jul 77

| Test   | Results  | Interpretation  |
|--|--|---|
| <u>PHOTOCHEMICAL SKIN IRRITATION STUDIES</u>   |  |   |
| <u>Rabbits</u>   |  |   |
| A single application (0.05 ml) of a 25 percent (w/v) solution of the compound (AI3-36080) and of a 10 percent (w/v) oil of Bergamot solution (positive control) in 95 percent ethyl alcohol, were applied to the intact skin of six rabbits. Five minutes after application, the rabbits were exposed to UV light (365 nm) for 30 minutes at a distance of 10-15 cm. | A 25 percent solution of AI3-36080 in ethanol did not cause a photochemical irritation reaction under test conditions.       | Compound AI3-36080 did not cause a photochemical irritation reaction under test conditions and is not expected to cause a photochemical irritation in humans. |
|  | Ethanol solutions of AI3-36080 caused mild to moderate irritation reactions to both the UV and non-UV irradiated skin areas. | Ethanol solutions may cause some slight discomfort if applied to sensitive individuals.   |
| <u>Control</u>   |  |   |
| Following UV exposure of the rabbits 0.5 ml of test compound, positive control and diluent were applied to additional skin areas to serve as unirradiated control sites. Application areas were checked for skin irritation reactions at 24, 48 and 72 hours.  | Positive control application and irradiation caused greater irritant effects than in unirradiated skin areas.                |   |

Study No. 51-0855-77, Mar 76-Jul 77

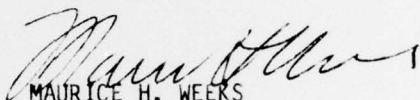
| Test   | Results   | Interpretation   |
|--|---|--|
| <u>SENSITIZATION STUDIES</u>   |   |  |
| <u>Guinea Pigs (Male)</u>  |   |  |
| Intradermal injections of<br>0.1 ml of<br>a 0.1 percent<br>suspension (w/v) of<br>AI3-36080 or of dinitrochlorobenzene<br>(DNCB)* in a mixture<br>containing 1 volume<br>of propylene glycol<br>and 29 volumes of<br>saline. |   |  |
| Ten test guinea pigs<br>received and challenged<br>with 0.1 percent<br>solution of AI3-36080   | Challenge dose of<br>test compound (last<br>intradermal injection)<br>did not produce a<br>sensitization<br>reaction.             | Compound AI3-36080 did<br>not produce a sensitiza-<br>tion reaction under these<br>tests conditions and is not<br>expected to produce a<br>sensitization reaction in<br>man. |
| Ten positive control<br>guinea pigs received<br>and challenged<br>with 0.1 percent<br>suspension of DNCB.  | Positive control (DNCB)<br>produced a marked<br>sensitization reaction<br>in ten out of ten guinea<br>pigs.                       |  |
| Ten cage control guinea<br>pigs.   | Cage control guinea pigs<br>showed no greater reaction<br>to test compound and DNCB<br>than were seen in original<br>test groups. |  |
| Five receiving challenge<br>dose of test compound<br>without prior<br>sensitizing doses.   |   |  |
| Five receiving challenge<br>dose of DNCB without<br>prior sensitizing doses.   |   |  |

\* A known skin sensitizer.

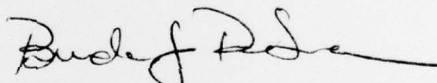
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5. CONCLUSION. Compound AI3-36080 produced no skin or eye irritation in rabbits, no photochemical irritation in rabbits, no sensitization reaction in guinea pigs and did not demonstrate an acute ingestion hazard. However, ethanol solutions may cause a slight irritant reaction if applied to the skin of sensitive individuals.

6. RECOMMENDATION. Under the provisions of the Memorandum of Understanding (reference paragraph 1b) it is recommended that AI3-36080, lactone of dihydrosasone, be approved for further testing as a candidate insect repellent. Medical surveillance should be made of individuals handling ethanol solutions of this compound or when the compound might be used as a topical repellent.

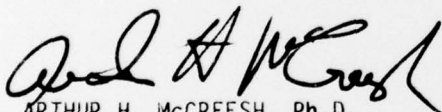


MAURICE H. WEEKS  
Chief, Toxicity Evaluation Branch  
Toxicology Division

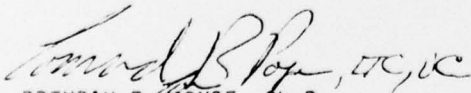


BRENDA J. DeSENA  
SP4  
Veterinary Specialist  
Toxicology Division

APPROVED:



ARTHUR H. MCCREESH, Ph.D.  
Chief, Toxicology Division



BRENDAN E. JOYCE, Ph.D.  
LTC, MSC  
Director, Laboratory Services

APPENDIX

TOPICAL HAZARD EVALUATION PROGRAM  
DEFINITIONS OF CATEGORIES OF COMPOUNDS BEING  
CONSIDERED FOR ACUTE SKIN APPLICATION

CATEGORY I - Compounds producing no primary irritation of the intact skin or no greater than mild primary irritation of the skin surrounding an abrasion. (INTERPRETATION: No restriction for acute application to the human skin.)

CATEGORY II - Compounds producing mild primary irritation of the intact skin and the skin surrounding an abrasion. (INTERPRETATION: Should be used only on human skin found by examination to have no abrasions or may be used as a clothing impregnant.)

CATEGORY III - Compounds producing moderate primary irritation of the intact skin and the skin surrounding an abrasion. (INTERPRETATION: Should not be used directly on the skin without a prophetic patch test having been conducted on humans to determine irritation potential to human skin. May be used without patch testing, with extreme caution, as clothing impregnants. Compound should be resubmitted in the form and at the intended use concentration so that its irritation potential can be reexamined using other test techniques on animals.)

CATEGORY IV - Compounds producing moderate to severe primary irritation of the intact skin and of the skin surrounding an abrasion and, in addition, producing necrosis, vesiculation and/or eschars. INTERPRETATION: Should be resubmitted for testing in the form and at the intended use concentration. Upon resubmission, its irritation potential will be reexamined using other test techniques on animals, prior to possible prophetic patch testing in humans, at concentrations which have been shown not to produce primary irritation in animals.)

CATEGORY V - Compounds impossible to classify because of staining of the skin or other masking effects owing to physical properties of the compound. (INTERPRETATION: Not suitable for use on humans.)

EYE CATEGORIES:

A. Compounds noninjurious to the eye. INTERPRETATION: Irritation of human eyes is not expected if the compound should accidentally get into the eyes, provided it is washed out as soon as possible.

B. Compounds producing mild injury to the cornea. INTERPRETATION: Should be used with caution around the eyes.



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C. Compounds producing mild injury to the cornea, and in addition some injury to the conjunctiva. INTERPRETATION: Should be used with caution around the eyes and mucosa.

D. Compounds producing moderate injury to the cornea. INTERPRETATION: Should be used with extreme caution around the eyes.

E. Compounds producing moderate injury to the cornea, and in addition producing some injury to the conjunctiva. INTERPRETATION: Should be used with extreme caution around the eyes and mucosa.

F. Compounds producing severe injury to the cornea and to the conjunctiva. INTERPRETATION: Should be used with extreme caution. It is recommended that use be restricted to areas other than the face.



